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Patent and Trademark Office**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/178,968 10/26/98 DULANEY

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EXAMINER

RODRIGUEZ, A

ART UNIT

PAPER NUMBER

2877

DATE MAILED:

04/12/01

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

## Office Action Summary

Application No.

09/178,968

Applicant(s)

DULANEY ET AL.

Examiner

Armando Rodriguez

Art Unit

2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☐ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 8, 10-23, 26 and 28-38 is/are rejected.
- 7) ☒ Claim(s) 6, 7, 9, 24, 25, 27 is/are objected to.
- 8) ☐ Claims \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

### Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_.
- 18) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: \_\_\_\_\_.

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## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1,5,12,13,16,19,23,30,31 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Epstein et al (PN 5,127,019) in view of Hackel et al (PN 6,198,069).

In figure 1 Epstein et al illustrates a laser peening system (10) amplifying a laser pulse by multiple passes, sharpening the laser pulse (10'), and directing the laser pulse to a target (11). In the abstract it is disclosed sharpening the laser pulse by phase conjugation (18a, 18e), by stimulated Brillouin scattering (18d, 18e), and by Faraday isolator (18b). In column 19 lines 29-31 it is disclosed that typical amplifier rods are neodymium-doped glass (23a, 23b, 23'a, 23b).

Epstein et al does not expressly disclose a single transverse mode laser.

Hackel et al discloses a single transverse mode laser used in a laser shock process of a work surface.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to apply the laser system of Hackel et al to Epstein et al because it provide for a laser peening system which creates a single transverse mode laser pulse.

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Therefore, it would have been obvious to combine Hackel et al with Epstein et al to obtain the invention as specified in claims 1,5,12,13,16,19,23,30,31,34.

Claims 3,8,14,15,17,18,21,26,32,33,35-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Epstein et al (PN 5,127,019) in view of Hackel et al (PN 6,198,069) as applied to claims 1 and 19 above, and further in view of Heppner et al (PN 5,566,195), Hans (PN 3,628,173), Johnston et al (PN 3,576,502) and Richards (APPLIED OPTICS).

In column 2 lines 21-24, Hans discloses a single transverse mode is obtained by an aperture plate (13), whereby in column 4 lines 18 and 19 refers to it as an iris (13). Since Hans was patented in 1971, it is suggested that this technique of obtaining a single transverse mode laser by using an aperture was known in the art.

In column 1 lines 39-43, Heppner et al discloses the drawbacks of a multi-mode laser which damages the optical system and overcoming such disadvantage by using a mono-mode laser.

In column 3 lines 11-15 Johnston et al discloses a dual cavity laser with a rotator between the cavities and also discloses, an isolator composed of a prism (30) and a Faraday rotator (40) wherein he states that such technique is well known in the art. Furthermore, the same components are used by Richards to provide birefringence to the laser system. However, Richards discloses using a 45 degree rotator but it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

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Regarding claims 8 and 26 wherein the aperture is less than 5mm, since Hans discloses an aperture it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the teachings of Hans and Heppner et al to Epstein et al because it discloses a technique of obtaining a single transverse mode laser to avoid damages to the optical system which will prolong the life of the laser system.

**Claims 2, 4, 20, 22, and 37, 38** are rejected under 35 U.S.C. 103(a) as being unpatentable over Epstein et al (PN 5,127,019) in view of <sup>Hockel et al (PN 6,198,069)</sup> Heppner et al (PN 5,566,195) and Hans (PN 3,628,173) as applied to **claims 1 and 19** above, and further in view of Richards (APPLIED OPTICS). *AK*

Richards discloses the use of a rotator and a porro prism for birefringence compensation as illustrated in figures 4 and 5. He also discloses the use of telescope within the oscillator.

Therefore, it would have been obvious to one of ordinary skill in the art to use the components used by Richards in a laser system because it provides birefringence compensation to the laser.

**Claims 10 and 28** are rejected under 35 U.S.C. 103(a) as being unpatentable over Epstein et al (PN 5,127,019) in view of <sup>Hockel et al (PN 6,198,069)</sup> Heppner et al (PN 5,566,195) and Hans *AK*

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(PN 3,628,173) as applied to **claims 1 and 19** above, and further in view of Staver et al (PN 5,987,042).

In column 2 lines 41-43 Staver et al discloses the use of pulse slicer for sharpening the pulse of the laser as illustrated in figure 1.

Therefore, it would have been obvious to one of ordinary skill in the art to apply Staver et al because it sharpen the pulse of a peening laser.

***Allowable Subject Matter***

**Claims 6,7,9 and 24,25,27** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

None of the prior art alone or in combination discloses a peening laser system having the structural combination of a gradient reflector or having a single longitudinal mode laser being an etalon or a seed laser.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Armando Rodriguez whose telephone number is (703) 308-6218. The examiner can normally be reached on 10-hour day / M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on (703) 308-4881. The fax phone numbers


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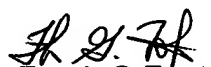
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for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7721 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

  
Armando Rodriguez  
Examiner  
Art Unit 2877

  
Frank G Font  
Supervisor  
Art Unit 2877

Ar/FGF  
April 8, 2001